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EXAMINER

GRIER, LAURA A

ART UNIT PAPER NUMBER

2644

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/575,910

Applicant(s)

KOCHANSKI ET AL.

Examiner

Laura A. Grier

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-22, 24-28, 30, 31, 33, 34, 37 and 39-43 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37, 41 and 42 is/are allowed.
- 6) ☒ Claim(s) 1-2, 4, 9-10, 12-13, 19-20, 22, 24-25, 28, 30-31 and 43 is/are rejected.
- 7) ☒ Claim(s) 3, 5-8, 13-18, 21, 25-27, 33 and 34 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. The indicated allowability of claims 4, 10, 24, 28, 30-31 is withdrawn in view of the newly discovered reference(s) to Brandstein et al. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4, 9-10, 12-13, 19-20, 22, 24, 28 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandstein et al., U. S. Patent No. 5581620.

Regarding claims 1, 12, and 22, Brandstein et al. (herein, Brandstein) discloses a method and apparatus for adaptive beamforming. Brandstein's disclosure comprises filters (20) for filtering signals for microphones (16) – a sensor array, which reads on filtering; adders (74) with the signal processor (78) and summing element (34) for providing a beamed output signal, which reads on combining the processed audio signals in a nonlinear manner (figure 3, col. 10, lines 50-53 and col. 11, lines 55-63, and col. 12, lines 31-57), wherein inherent that the nonlinear estimation processing discriminates against noise originating at an unknown location outside of the desired regions as evident by the fact performance of the beamforming apparatus (col. 4,

lines 6-12), and Brandstein further indicates for the purpose of improving the signal-to-noise rejection a statistical technique, including the determining the median of plural signals may be used, which indicates the nonlinear signal estimation processing picks a representative of the central value, therein. Thus, making it obvious to one of the ordinary skill in the art at the time the invention was made to implementing nonlinear estimation processing representative of a median or central value of processed signals as taught by Brandstein.

Regarding claim 2, Brandstein discloses everything claimed as applied above (see claim 1). Brandstein further discloses the claimed limitations in col. 11, lines 4-16 and reference 38.

4. Claims 4, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandstein.

Regarding claims 24 and 28 Brandstein discloses a method and apparatus for adaptive beamforming. Brandstein's disclosure comprises filters (20) for filtering signals for microphones (16) – a sensor array, which reads on filtering; adders (74) with the signal processor (78) and summing element (34) for providing a beamed output signal, which reads on combining the processed audio signals in a nonlinear manner (figure 3, col. 10, lines 50-53 and col. 11, lines 55-63, and col. 12, lines 31-57), wherein inherent that the nonlinear estimation processing discriminates against noise originating at an unknown location outside of the desired regions as evident by the fact performance of the beamforming apparatus (col. 4, lines 6-12), and Brandstein further indicates for the purpose of improving the signal-to-noise rejection a statistical technique, including the determining the median of plural signals may be used. Thus, making it obvious to one of the ordinary skill in the art at the time the invention was made to implementing nonlinear estimation processing representative of a median or central value of

processed signals as taught by Brandstein. However, Brandstein fails to disclose a feedback control loop. The examiner takes official notice that feedback loop control signal was well known in the art.

Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Brandstein by implementing a feedback loop for providing a control signal for improving the signal processing of the microphone signals to help eliminate particular unwanted signal components or microphone characteristics that may result in the signal, such as howling and others.

Regarding claim 4, Brandstein discloses everything claimed as applied above (see claim 1). However, Brandstein fails to disclose a feedback control loop. The examiner takes official notice that feedback loop control signal was well known in the art. Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Brandstein by implementing a feedback loop for providing a control signal for improving the signal processing of the microphone signals to help eliminate particular unwanted signal components or microphone characteristics that may result in the signal, such as howling and others.

Regarding claim 9-10, Brandstein discloses everything claimed as applied above (see claim 1). Brandstein discloses the claimed limitation in col. 7, lines 1-35, wherein phase alignment is applied in the signal processor, which performed in respect to magnitude and phase, which obviously provides support of amplitude adjustments, therein.

Regarding claim 13, Brandstein discloses everything claimed as applied above (see claim 1). Brandstein further discloses in magnitude adjusting in col. 7, lines 1-35, wherein phase alignment is applied in the signal processor.

Regarding claim 19, Brandstein discloses everything claimed as applied above (see claim 1). However, Brandstein fail to disclose the estimation processing based on multiple values from each processed audio signal over a period. It would have been obvious one of the ordinary skill it sample and process a collective set of data for a particular period of time to obtain better and more conclusive results.

Regarding claim 20, Brandstein discloses everything claimed as applied above (see claim 19). The filters (20) implement time-to-frequency elements, thus obviously applying temporal filtering.

Regarding claims 30-31, Brandstein discloses a method and apparatus for adaptive beamforming. Brandstein's disclosure comprises filters (20) for filtering signals for microphones (16) – a sensor array, which reads on filtering; adders (74) with the signal processor (78) and summing element (34) for providing a beamed output signal, which reads on combining the processed audio signals in a nonlinear manner (figure 3, col. 10, lines 50-53 and col. 11, lines 55-63, and col. 12, lines 31-57), wherein inherent that the nonlinear estimation processing discriminates against noise originating at an unknown location outside of the desired regions as evident by the fact performance of the beamforming apparatus (col. 4, lines 6-12), and Brandstein further indicates for the purpose of improving the signal-to-noise rejection a statistical technique, including the determining the median of plural signals may be used. Thus, making it obvious to one of the ordinary skill in the art at the time the invention was made to

implementing nonlinear estimation processing representative of a median or central value of processed signals as taught by Brandstein. Brandstein further discloses in magnitude adjusting in col. 7, lines 1-35, wherein phase alignment is applied in the signal processor.

Regarding claim 39-40, Brandstein discloses everything claimed as applied above (see claim 28). Brandstein discloses the claimed limitation in col. 7, lines 1-35, wherein phase alignment is applied in the signal processor, which performed in respect to magnitude and phase, which obviously provides support of amplitude adjustments, therein.

Regarding claim 43, Brandstein discloses a method and apparatus for adaptive beamforming. Brandstein's disclosure comprises filters (20) for filtering signals for microphones (16) – a sensor array, which reads on filtering; adders (74) with the signal processor (78) and summing element (34) for providing a beamed output signal, which reads on combining the processed audio signals in a nonlinear manner (figure 3, col. 10, lines 50-53 and col. 11, lines 55-63, and col. 12, lines 31-57), wherein inherent that the nonlinear estimation processing discriminates against noise originating at an unknown location outside of the desired regions as evident by the fact performance of the beamforming apparatus (col. 4, lines 6-12), and Brandstein further indicates for the purpose of improving the signal-to-noise rejection a statistical technique, including the determining the median of plural signals may be used. Thus, making it obvious to one of the ordinary skill in the art at the time the invention was made to implementing nonlinear estimation processing representative of a median or central value of processed signals as taught by Brandstein. Brandstein discloses the claimed limitation in col. 7, lines 1-35, wherein phase alignment is applied in the signal processor, which performed in

respect to magnitude and phase, which obviously provides support of amplitude adjustments, therein.

5. Claims 3, 5-8, 13-18, 21, 26-27 and 33-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. Claims 37, and 41-42 are allowed.

Response to Arguments

7. Applicant's arguments with respect to claims 1-10, 12-22, 24-28, and 30-31, 33-34, 37 and 39-43 have been considered but are moot in view of the new ground(s) of rejection.

The applicant essentially argued that prior art of record failed to disclose the nonlinear signal estimation processing consisting of picking a representative, central value or median from the processed audio signals. Brandstein discloses that statistical techniques such as determining a medial signal from among a plurality of signals, which is used to improve the signal-to-noise rejection among desired signal pick-up and the unwanted signals from the environment of the microphones.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A. Grier whose telephone number is (571) 272-7518. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

Art Unit: 2644

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh N. Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Laura A. Grier
May 31, 2005